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Quebec Region

Proceedings of the Regional Peer Review of the Estuary and Northern Gulf of St. Lawrence Snow Crab Stocks Assessment

February 24th and 25th, 2015
Mont-Joli, QC

Chairperson: Denis Chabot
Rapporteur: Sonia Dubé

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December 2015

Canada

Foreword

The purpose of these Proceedings is to document the key activities and discussions of the meeting. The Proceedings may include research recommendations, uncertainties and the rationale for decisions made during the meeting. The Proceedings may also document when data, analyses or interpretations were reviewed and rejected on scientific grounds, including the reason(s) for rejection. As such, interpretations and opinions presented in this report may be factually incorrect or misleading, but are included to record, as faithfully as possible, what was considered at the meeting. No statements are to be taken as reflecting the conclusions of the meeting unless they are clearly identified as such. Moreover, further review may result in a change of conclusions where additional information was identified as relevant to the topics being considered, but not available within the timeframe of the meeting. In the rare case when there are formal dissenting views, these are also archived as Appendices to the Proceedings.

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SUMMARY

This document contains the proceeding from the meeting held within the regional assessment process on Snow crab in the Estuary and Northern Gulf of St. Lawrence. This review process was held on February 24th and 25th, 2015 at the Maurice Lamontagne Institute in Mont-Joli. This meeting gathered more than fifty participants from science, management and industry. These proceedings contain the essential parts of the presentations and discussions held, and report the recommendations and conclusions that were presented during the review.

SOMMAIRE

Ce document renferme le compte rendu de la réunion tenue dans le cadre du processus régional d'évaluation des stocks de crabe des neiges de l'estuaire et du nord du golfe du Saint-Laurent. Cette revue, qui s'est déroulée les 24 et 25 février 2015 à l'Institut Maurice-Lamontagne à Mont-Joli, a réuni plus de cinquante participants des sciences, de la gestion et de l'industrie. Ce compte rendu contient l'essentiel des présentations et des discussions qui ont eu lieu pendant la réunion et fait état des recommandations et conclusions émises au moment de la revue.

INTRODUCTION

The Quebec Region of the Department of Fisheries and Oceans (DFO) is responsible for assessing the stocks of several exploited fish and invertebrate species in the Estuary and Gulf of St. Lawrence. Most of these stocks are assessed periodically within a regional advisory process, which is conducted at the Maurice Lamontagne Institute in Mont-Joli. This document consists of the proceedings of the meeting held on February 24 and 25, 2015 on the assessment of the Estuary and Northern Gulf of St. Lawrence Snow Crab stock.

The objective of the review was to determine whether there were any changes in the resource's status and whether adjustments were required to the management plans based on the chosen conservation approach, the ultimate goal being to provide scientific advice on managing the Snow Crab stock in the Estuary and Northern Gulf of St. Lawrence for the 2015 fishing season.

These proceedings report on the main points discussed in the presentations and deliberations stemming from the activities of the stock assessment regional committee. The regional review is a process open to all participants who are able to provide a critical outlook on the status of the evaluated resources. In this regard, participants from outside DFO are invited to take part in the committee's activities within the defined Terms of Reference for this review (Appendices 1 and 2). The proceedings also focus on recommendations made by the meeting participants.

CONTEXT

Meeting chairperson, Denis Chabot, goes over the objectives of the peer review and how it will proceed. Stock assessment biologist Jean Lambert presents the agenda and the meeting's Terms of Reference. Mr. Lambert presents a general overview of landings by fishing area (12A, 12B, 12C, 13, 14, 15, 16, 16A and 17). Area 16 contributes the largest share of landings.

The conservation principle that applies to these areas targets the protection of reproductive potential. Management measures include limits imposed on catches via a total allowable catch (TAC), effort controls (number of traps, number of licenses and fishing season) and a minimum legal carapace size set at 95 mm. In addition, the fishery is closed when catches in one area include more than 20% white crab. The data used in the assessment are mainly from the fishery (ZIFF and logbooks, commercial sampling) and independent sources (post-season survey, trawl survey). These data provide the key stock status indicators, including the commercial catch per unit effort (CPUE), post-season number per unit effort (NPUE), combined CPUE and NPUE index, carapace condition at landing, outlook for recruits/adolescents and crab left by the fishery, distribution of fishing effort, average size and size frequency.

Mr. Lambert goes on to briefly define the various carapace conditions and crab categories mentioned in the review. Then, he states that the combined index is based on the average of both commercial biomass indices (standardized CPUE from the commercial fishery and NPUE of adults ≥ 95 mm in the post-season survey).

ASSESSMENT OF THE RESOURCE

Mr. Lambert reviews the key indicators for each fishing area. Participants ask questions and make comments. A summary is presented as well as a wording of three harvest scenarios and their potential impact on biomass. In this meeting, participants must agree on the formulation of all three scenarios (intensive, intermediate, careful). The preferred option will be discussed at the Advisory Committee meeting. It is explained that this new approach meets a request made by highest departmental authorities.

- Given the potential impact of climate change on the resource, it is suggested that a presentation be included on the status of the Gulf of St. Lawrence (environmental conditions) during the next peer review.

AREA 12B

Indicators: Area 12B

The TAC increased by 20% (to 468 t) between 2013 and 2014, and catches were 458 t. The commercial fishery catch rate decreased significantly, from the highest value in the series, to a value slightly below average. Landings consisted primarily of intermediate-shell crabs. This decrease in catch rate is inconsistent with the 2013 post-season survey, which indicated that the biomass available to the fishery would be high in 2014. The 2014 fishing season was atypical in comparison with the previous years, in the sense that the CPUE was very low at the start, possibly due to environmental conditions.

The 2014 post-season survey suggests that the biomass available to the fishery will be considerably lower in 2015 than it was in 2014, due to a drop in recruitment and residual biomass. There was a sharp decrease in the combined index of commercial CPUE and NPUE from the post-season survey. The post-season survey shows a decrease in the abundance of adolescents ≥ 78 mm to a value below average, which suggests that recruitment to the fishery will be lower in the short and medium term than it has been since 2011.

The drop in the combined index, despite some uncertainty, suggests that 2015 catches should decrease considerably compared to 2014:

Participant questions and comments:

- The decrease seen in 2014 is a little surprising. The indicators of previous years do not point to a decrease of this magnitude. However, it is noted that the decrease in size, which began two years ago, was perhaps a sign of this decrease.
- Questions are raised about the predictive power of the post-season survey. Although some inconsistencies are pointed out (especially between the CPUE in 2014 and the 2013 post-season survey), it is felt that the strong trend is still reliable. The two indices (commercial CPUE and post-season NPUE) parallel one another and suggest a decrease in the resource.
- In addition, it is pointed out that there is definitely a bit of noise in the system (weather at the beginning of the season, trap interactions, catchability, etc.)
- Some industry representatives show greater dispersion in their fishing effort in response to changes in the distribution of the resource. The participants wonder about these distribution changes that could be linked to environmental changes.
- Some participants believe that there is a great deal of uncertainty in the data presented.

Summary and perspectives: Area 12B

Mr. Lambert presents a summary and scenarios for Area 12 B. Finally, the participants decide to review the Area 16 indicators and the wording for Area 12B thereafter.

AREA 16

Indicators: Area 16

The TAC increased by 20% (to 5,527 t) between 2013 and 2014, and was reached. The catch rate for the commercial fishery remained stable in 2014 and is well above average. Landings have consisted primarily of recruits since 2006.

The post-season survey suggests that the biomass available to the fishery will be considerably lower in 2015 than it was in 2014, due to a drop in recruitment and residual biomass. There was a decrease in the combined index of commercial CPUE and NPUE from the post-season survey, but it remains high. The post-season survey shows a decrease in the abundance of adolescents ≥ 78 mm to a value near the average, which suggests that recruitment to the fishery will be lower in the short and medium term than it has been since 2011. The trawl survey conducted in the western part of the area indicates that recruitment will be lower for a few years.

The drop in the combined index suggests that 2015 catches should decrease compared to 2014.

No questions are raised by the participants following the indicator review.

Trawl survey

The review of area 16 includes a brief presentation on recruitment in Baie Sainte-Marguerite. Bernard Sainte-Marie illustrates the evolution of three recruitment waves in an approximate eight year cycle. There was a decrease from one wave to another, which seems linked to increasing temperatures at the sea surface (larval survival) and bottom (juvenile survival). If these results can be generalized to all of Area 16, we could observe a decrease in the resource in the coming years. It is believed that the next recruitment wave (2015) will produce a greater number of smaller individuals, because of colder conditions.

- It is confirmed that the weather represents a leading factor in Snow Crab biomass regulation, its temperature tolerance range being rather narrow.
- It is noted that the colder conditions are, the smaller the crabs are at terminal moult, and a greater number of crabs will not reach commercial size. Conversely, the warmer conditions are, the bigger the crabs are at terminal moult. Thus, the warmer the water, the bigger the crabs will get. However, there is a limit to this trend. Mortality increases when temperatures exceed 4 to 5°C.

Summary and perspectives: Area 16

The participants discuss the summary and scenarios presented:

- The participants seem to be pleased with the perspectives presented.
- The only issue involves the first scenario. Participants decide to remove the status quo.

Finally, the participants agree on the following scenarios:

1. Too low a decrease in catches would lead to a high harvesting intensity and possibly to a rapid decrease in biomass available to the fishery starting in 2016.
2. It is unlikely that a decrease of approximately 20% would lead to an excessively high harvesting intensity and would moderate the expected short- and medium-term decline in stocks.

3. Any decrease greater than 20 % could lead to the maintenance of a substantial biomass available to the fishery over a longer period of time.

Return to Area 12B

Rereading scenarios for Area 12B elicits a few comments:

- In the first scenario, it is suggested that the status quo be removed.
- As for the second scenario, the industry would be more comfortable with a range of 20% to 25% rather than 25% to 50%, as proposed. Science believes that 25% would be more accurate. A decrease in catches of "about 25%" is agreed to, but it is felt that it is important to mention the uncertainty in this.

Finally, the participants agree on the following scenarios:

1. Too low a decrease in catches would lead to a high harvesting intensity and to a sharp decrease in biomass available to the fishery in 2016.
2. A decrease of approximately 25% could lead to a moderate harvesting intensity, which would reduce the expected short- and medium-term decline in stocks.
3. An even larger decrease would be consistent with biomass indicators and could stabilize the biomass available to the fishery in the short and medium term.

AREA 12A

Indicators: Area 12A

The TAC increased by 10% (to 191 t) between 2013 and 2014, and catches were 178 t. The commercial fishery catch rate decreased in 2014 and is equal to the average. Landings consisted primarily of intermediate-shell crabs.

There was no post-season survey in 2013. The 2014 post-season survey suggests that there will be less biomass available to the fishery in 2015 than in 2013 due to a significant decrease in the residual biomass and a slight decrease in recruitment. The combined index of commercial CPUE and NPUE from the post-season survey decreased and is below the average. The post-season survey points to an increase in abundance of adolescents ≥ 78 mm, suggesting that recruitment to the fishery could increase in the medium term.

The drop in the combined index suggests that 2015 catches should decrease compared to 2014:

Participant questions and comments:

- It is noted that there are more adults under the legal size limit. It seems that crabs tend to moult earlier when the residual biomass decreases.
- There is also an observed change in the distribution of crabs, which is linked to a colder winter. Since the cold intermediate layer (CIL) is thicker, coastal habitats would be more extensive, which would promote greater dispersion of crab.

Summary and perspectives: Area 12A

The participants discuss the summary and scenarios presented:

- It is suggested that the status quo for the first scenario be removed.

- In the second scenario, the suggested range (20% to 40%) is considered too high. The participants agree on a value of "about 20%".

Finally, the participants agree on the following scenarios:

1. Too low a decrease in catches could lead to a high harvesting intensity and possibly to a decrease in the biomass available to the fishery in 2016.
2. A decrease of approximately 20% should lead to a moderate harvesting intensity and help maintain the biomass available to the fishery;
3. A larger decrease would foster an increase in biomass available to the fishery in the short and medium term.

AREA 17

Indicators: Area 17

The TAC decreased by 20% (to 1447 t) between 2013 and 2014, and catches were 1,342 t. The commercial fishery catch rate decreased in 2014 and was well below the average. Landings consisted primarily of intermediate-shell crabs.

The post-season survey suggests that the biomass available to the fishery in 2015 will be similar to 2014, despite a slight increase in recruitment. There was a decrease in the combined index of commercial CPUE and NPUE from the post-season survey, and is low. There was a decrease in the average size of crabs caught in the commercial fishery. According to the post-season survey it should decrease in 2015, as a result of declining residual biomass and the start of a new recruitment wave to the fishery. The post-season survey indicates a considerable increase in the abundance of adolescents ≥ 78 mm. These results are consistent with those from the trawl survey and experimental traps, which suggest that a significant number of crabs will reach legal size for at least 4 years, starting in 2015. Thus, given the low residual biomass, there is a high risk of observing a large number of white crab in the catches.

The drop in the combined index suggests that 2015 catches should decrease compared to 2014.

Participant questions and comments:

- According to the participants, the next recruitment wave can be described as "high".
- Industry representatives state that changes to fishing practices will ensure that white crab are protected. According to them, early closure will be much more effective in protecting white crab than a TAC. They do not wish to "get" into white crab.

Summary and perspectives: Area 17

The participants discuss the summary and scenarios presented:

- In the first scenario, they favour keeping the status quo.
- In the second scenario, they agree to a reduction of approximately 10%.
- The third scenario would show "greater than 10%".
- It is important to clarify the situation by mentioning that other measures must be put in place to protect white crab, which is a priority for the participants.

Finally, the participants agree on the following scenarios:

1) A status quo in catches would lead to a high harvesting intensity, which would slow the rate of increase in biomass available to the fishery;
2) A decrease of approximately 10% should lead to a moderate harvesting intensity and help the biomass available to the fishery increase more rapidly;
3) Any decrease greater than 10% would lead to an even more rapid increase in biomass available to the fishery and would reduce the risk of harvesting large quantities of white crab in 2016.

Additionally, it is stated that any additional white crab protection measures used will be beneficial for the stock.

AREAS 15, 16A AND 12C

Indicator review: Areas 15, 16A and 12C

Area 15

The TAC increased by 10% between 2013 and 2014, peaked at 718 t and was reached. The commercial fishery catch rate decreased slightly in 2014, but was considerably more than the average. Landings contained a slight majority of intermediate-shell crabs.

The post-season survey suggests that there will be more biomass available to the fishery in 2015 due to high recruitment. There was a slight increase in the combined index of commercial CPUE and NPUE from the post-season survey. This value is high. The post-season survey reveals that the abundance of adolescents ≥ 78 mm decreased to a value slightly below average, suggesting that recruitment to the fishery will decline in the medium term.

The combined indicator suggests that it is possible to maintain 2015 harvests at their 2014 levels.

Participant questions and comments:

- There was a westward shift in fishing effort for climatic and economic reasons unrelated to the abundance of the resource.
- It is noted that the decrease in adolescents ≥ 78 mm occurred in all areas of the North Shore.
- It is mentioned that the post-season survey series was resumed with two Japanese traps rather than four regular traps. Sampling with larger traps (standard traps) has started, but the data will not be included in the analyses before 2016. Possible implications of this change in the protocol are discussed. This topic will be revisited in the next reviews. The biologist says that these changes will apply the same way for Areas 12C and 16A.

Area 16 A

The TAC was 10% higher in 2014 than in 2013, peaked at 515 t, and was reached. The commercial fishery catch rate increased in 2014 and is above the average. Landings contained a majority of intermediate-shell crabs.

The post-season survey suggests that the biomass available to the fishery in 2015 will be similar to what it was in 2014, due to an increase in recruitment and a drop in residual biomass. The combined index of commercial CPUE and NPUE from the post-season survey increased in

2014 and is now above average. The post-season survey indicates an increase in adolescent crabs ≥ 78 mm to a value slightly above the average.

The rise in the combined index suggests a possible increase in catches in 2015 compared with 2014.

The participants have no questions.

Area 12C

The TAC remained stable from 2013 to 2014, to a peak of 352 t, and was reached. The commercial fishery catch rate increased slightly in 2014 and is near the average. Landings contained a slight majority of intermediate-shell crabs.

The post-season survey suggests that there will be less biomass available to the fishery in 2015 than in 2014. Recruitment increased slightly and residual biomass decreased significantly. The combined index of commercial CPUE and NPUE from the post-season survey decreased and is below the average. The post-season survey reveals that the abundance of adolescents ≥ 78 mm decreased to a value near the average, suggesting that recruitment will decline in the medium term.

The drop in the combined index suggests that 2015 catches should be smaller than in 2014.

Participants mention that:

- Compared to areas 15 and 16A, the post-season survey in 12C decreased considerably.

Summary and perspectives: Areas 15, 16A and 12C

Area 15

The participants discuss the summary and scenarios presented:

- As regards the second scenario, it is decided that the status quo be maintained, which could involve a 5% increase in practice, as mentioned.

Finally, the participants agree on the following scenarios:

1) An increase in catches greater than 10% would lead to a high harvesting intensity and could reduce the biomass available to the fishery in 2016.
2) A status quo would likely not entail an excessively high harvesting intensity and would moderate the effects of lower expected recruitment in the medium term.
3) Any decrease in catches could lead to maintenance of a substantial biomass available to the fishery over a longer period of time.

Area 16A

There is consensus on the scenarios presented:

1) An increase in catches greater than 15% would lead to a high harvesting intensity and could decrease the biomass available to the fishery in 2016.
2) It is unlikely that an increase of approximately 10% would lead to an excessively high harvesting intensity and could foster maintenance of the biomass available to the fishery;
3) A status quo or a decrease in catches could lead to maintenance of a substantial biomass available to the fishery over a longer period of time.

Area 12C

According to the participants, the scenarios are consistent with the indicators. There is consensus.

These scenarios are as follows:

1) A status quo in catches would lead to a high harvesting intensity and possibly to a decrease in the biomass available to the fishery in 2016.
2) It is unlikely that a decrease of approximately 10% would lead to an excessively high harvesting intensity and would moderate the effect of lower expected recruitment in the medium term;
3) Any decrease greater than 15% could lead to the maintenance of a substantial biomass available to the fishery over a longer period of time.

AREA 14

Indicator review: Area 14

The TAC increased by 35% (to 605 t) between 2013 and 2014, and was reached. The commercial fishery catch rate increased in 2014 and is well above the average. Landings consisted of equal numbers of recruits and intermediate-shell crabs.

The post-season survey suggests that the biomass available to the fishery will be higher in 2015 than in 2014 because of a large increase in recruitment. The combined index of commercial CPUE and of NPUE from the post-season survey is at its highest level. The post-season survey reveals that the abundance of adolescents ≥ 78 mm decreased, suggesting that recruitment will decline in the medium term.

The rise in the combined index suggests that catches could possibly be increased 2015 compared to 2014.

Participant questions and comments:

- Smaller crabs are observed in the post-season survey compared to the fishery since the post-season survey covers sites that are not operated by fishers. Soak time is also shorter in the post-season survey, which does not allow time for large crab to take the place of smaller ones.
- It is pointed out that it is encouraging to note that the number of adolescents ≥ 95 mm is increasing, and thus terminal moult is occurring at larger sizes. There would be a greater proportion of crabs possibly reaching the legal catch size. It seems that productivity is changing.
- Regarding the exploitation potential of smaller crabs, the importance of protecting the reproductive potential is noted. Small males play an important role in female insemination.
- It is mentioned that the post-season survey series was resumed with two Japanese traps rather than the usual four traps, as for other areas of the Lower North Shore, but that unlike areas 16A, 12C and 15, no tests were carried out with large traps in areas 14 and 13.

Summary and perspectives: Area 14

There is consensus among the participants on the scenarios presented:

1) An increase in catches greater the 25% would lead to a high harvesting intensity and could reduce the biomass available to the fishery in 2016.
2) It is unlikely that an increase of approximately 20% would lead to an excessively high harvesting intensity and would moderate the effect of lower expected recruitment in the medium term.
3) Any increase of less than 15% could lead to the maintenance of a substantial biomass available to the fishery over a longer period of time.

AREA 13

Indicators: Area 13

The TAC increased by 11% in 2013 and by 25% in 2014, (to 235 t), and was reached. The commercial fishery catch rate was stable between 2013 and 2014, and is above the 1988 – 2013 average. Fishing effort was higher in the southern part of the Area. Landings consisted of a slight majority of recruits and their proportion has been increasing since 2010.

In 2015, the post-season survey in the northern part suggests an increase in the biomass available to the fishery, whereas the post-season survey in the southern part points to a decrease. Based on these surveys, recruitment is high in the northern part and low in the southern part. There was an increase in the combined index of commercial CPUE and NPUE from the post-season surveys. The two post-season surveys and the trawl survey indicate a very low abundance of adolescents ≥ 78 mm, suggesting that recruitment to the fishery will decline in the medium term over the entire area.

The rise in the combined index suggests that 2015 catches may be increased compared to 2014.

Participant questions and comments:

- The trawl survey indicates a significant biomass of small crabs (11 mm).
- As in Area 14, an increasing number of legal-size crabs has been observed in catches, which is encouraging.
- According to the industry, crabs are still larger in the southern part compared to the northern part.
- The participants disapprove of the lack of Newfoundland-based observers. According to one member of the industry, a significant portion of the quota was caught without the presence of observers.

Summary and perspectives: Area 13

The participants discuss the summary and scenarios presented:

- Participants are concerned with the importance of properly distributing the fishing effort in this area. The participants wonder about how this concern should be considered in the text. For the sake of consistency with the wording for other areas, it was decided to include this concern in the summary (and not in the scenarios), indicating that it would be necessary to encourage a better distribution of fishing efforts between the north and south.

- While this concern is mentioned, the participants seem comfortable with the scenarios presented.

The following scenarios are presented and accepted:

1) An increase in catches greater the 25% would lead to a high harvesting intensity and could reduce the biomass available to the fishery in 2016;
2) It is unlikely that an increase of approximately 20% would lead to an excessively high harvesting intensity and would moderate the effect of lower expected recruitment in the medium term;
3) Any increase of less than 15% could lead to the maintenance of a substantial biomass available to the fishery over a longer period of time.

IDENTIFICATION AND PRIORITIZATION OF RESEARCH PROJECTS

Regarding research priorities, the objectives of the points raised are to:

- Develop a precautionary approach;
- Develop a pre-recruitment index for areas 16 and 15 through the trawl survey;
- Continue the Snow Crab habitat mapping;
- Examine the variation of NPUE or catchability with temperature or CIL volume;
- Include a brief presentation on the status of the Gulf (environmental conditions) in the next Snow Crab review;
- Collect temperature data during the post-season survey;
- Study the relevance of including the Teleost results in the Snow Crab review.

APPENDIX 1- TERMS OF REFERENCE

ASSESSMENT OF THE ESTUARY AND NORTHERN GULF OF ST. LAWRENCE SNOW CRAB STOCK

Regional Peer Review – Quebec Region

February 24-25, 2015
Mont-Joli, Québec

Chairperson: Denis Chabot

Context

The Snow Crab fishery in the Estuary and the northern Gulf of St. Lawrence began in the late 1960s. Landings have varied depending on the adjusted TACs based on the recruitment waves and troughs. In 2013, landings totalled 9,078 t, up from 2012.

The Estuary and northern Gulf of St. Lawrence are divided into nine management areas (13 to 17, 16A, 12A, 12B and 12C). The effort is also controlled by a fishing season and catches are limited by quota.

The resource is assessed each year to determine if the changes that have occurred in the status of the resource justify adjustments to the conservation approach and management plan.

Objectives

Provide scientific advice to determine TACs for the Snow Crab stocks in the Estuary and northern Gulf of St. Lawrence: management units 13 to 17, 12A, 12B and 12C, for the 2015 fishing season. The advice shall include:

- Description of the biology of the Snow Crab in the Estuary and northern Gulf of St. Lawrence.
- Description of the fishery including landings, fishing effort, carapace condition, size structure and mean carapace width for males.
- Analysis of catches per unit effort from the fishery.
- Analysis of data from post-season trap surveys conducted annually in collaboration with fishers. Indicators: NPUE of legal-size and sub-legal-size crabs, size, spermatheca load and carapace condition of males.
- Analysis of data from trawl survey(s) conducted annually in certain sectors or areas. Indicators: abundance index of legal-size and sub-legal-size males, maturity, size of both males and females.
- identification and prioritization of research projects to be considered for the future;
- Perspectives and/or recommendations on management measures in effect for the 2015 fishing season for each management unit, among other things, harvest levels and their potential effects on abundance and maintaining reproductive potential, based on a summary of the main indicators for the precautionary approach and short- and medium-term forecasts.

Expected publications

- CSAS Science Advisory Report on Snow Crab of the Estuary and Northern Gulf of St. Lawrence.
- CSAS Proceedings summarizing the discussion.

Participation

- Fisheries and Oceans Canada (DFO) Science and Ecosystem and Fisheries Management sectors
- Fishing industry
- Provincial representatives
- Aboriginal communities/organizations

APPENDIX 2: LIST OF PARTICIPANTS

Name	Affiliation	Feb. 24	Feb. 25
Bourassa, Luc	Biologist Consultant	X	X
Bourdages, Hugo	DFO Science	X	X
Bourdages, Yan	Industry	X	
Brassard, Claude	DFO Science	X	X
Brulotte, Sylvie	DFO Science	X	X
Calderon, Isabel	DFO Fisheries Management	X	X
Collin, Luc	Industry	X	
Chabot, Denis	DFO Science	X	X
Cloutier, Yvan	Industry	X	
Côté, Francis	Industry	X	
Côté, Langis	Industry	X	
Courtemanche, David	DFO Fisheries Management	X	
Cyr, Charley	DFO Science	X	X
Dallaire, Jean-Paul	DFO Science	X	X
Desgagnés, Mathieu	DFO Science	X	
Doucet, Marc	Industry	X	
Dubé, Pierre	Industry	X	
Dubé, Sonia	DFO Science	X	X
Duguay, Guy	Industry	X	
Dupuis, Mario	Industry	X	
Émond, Kim	DFO Science	X	
Estrada, Rafael	DFO Science	X	
Gagnon, Yves	DFO Science	X	
Gauthier, Johanne	DFO Science	X	
Gilbert, Michel	DFO Science	X	X
Girard, Mathieu	Industry	X	
Gosselin, Claude	Industry	X	
Joncas, Jean-Richard	Industry		X
Hartog, Frédéric	DFO Science	X	X
Hurtubise, Sylvain	DFO Science	X	X
Labrie, Jean	Industry	X	
Lambert, Jean	DFO Science	X	X
Lambert, Yvan	DFO Science	X	X
Landry, René	Industry	X	
Langelier, Serge	Industry	X	
Lavallée, Dean	Industry		X
Lemelin, Dario	DFO Fisheries Management	X	X
Le Mer, Charline	DFO Science	X	X
Léonard, Pierre	Industry	X	X
Marquis, Marie-Claude	DFO Science	X	X
Michaud, Marie-Claire	DFO Fisheries Management	X	
Morneau, Renée	DFO Science	X	X
Nadeau, Paul	Industry	X	X
Pinette, Majoric	Industry	X	X
Robert, Philip	Industry		X
Roy, François	DFO Science	X	
Sainte-Marie, Bernard	DFO Science	X	X
Stubbert, Curtis	Industry	X	X

Name	Affiliation	Feb. 24	Feb. 25
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Vanier, Caroline	DFO Science	X	X
Vigneault, Guy	Industry	X	